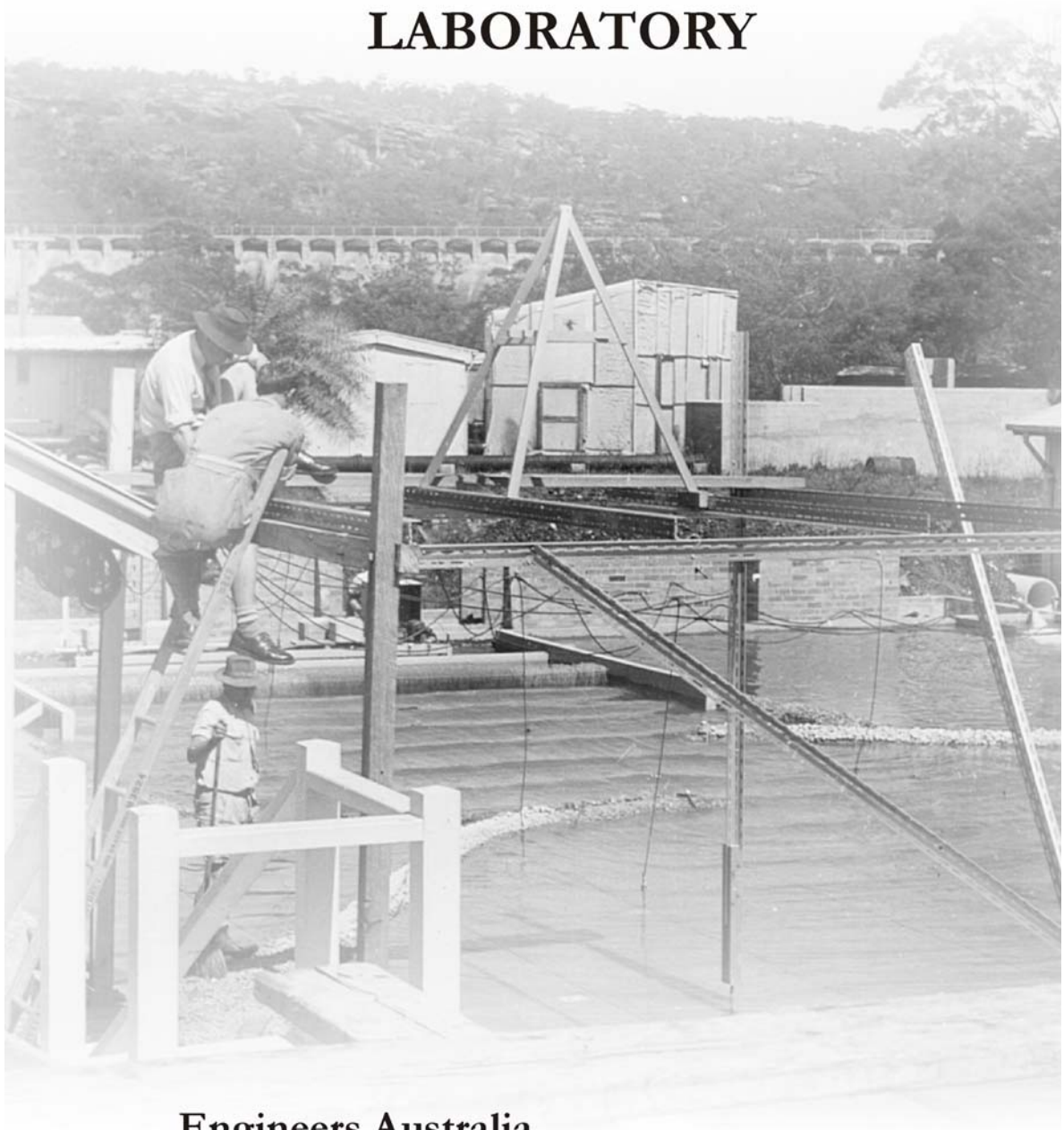


MANLY HYDRAULICS LABORATORY



**Engineers Australia
Historical Engineering Marker
Plaquing Nomination**

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Introduction

Located in Manly Vale in suburban Sydney, **Manly Hydraulics Laboratory** (MHL) is nestled between King Street and Manly Creek at the base of Manly Dam. The dam was the original water supply for the Manly area and when this function was transferred to larger supply dams to the west of Sydney in the early part of the twentieth century, the waters of Manly Dam were subsequently used for recreation and hydraulic modelling purposes.

The laboratories that were built downstream of the dam wall made use of the stored water capacity by directing water to scale models of proposed water infrastructure developments for NSW. This included dams and spillways, harbours, flood mitigation schemes and coastal protection works. Once the waters had passed through the scale models the waters were returned to Manly Creek a little further downstream, to continue the journey to the sea via Manly Lagoon.

At its peak in the 1950s the area below the dam wall catered to four hydraulics laboratories. These were:

- Manly Hydraulics Laboratory
- Sydney Water Board Hydraulics Laboratory
- Water Conservation and Irrigation Commission Laboratory
- Water Research Laboratory

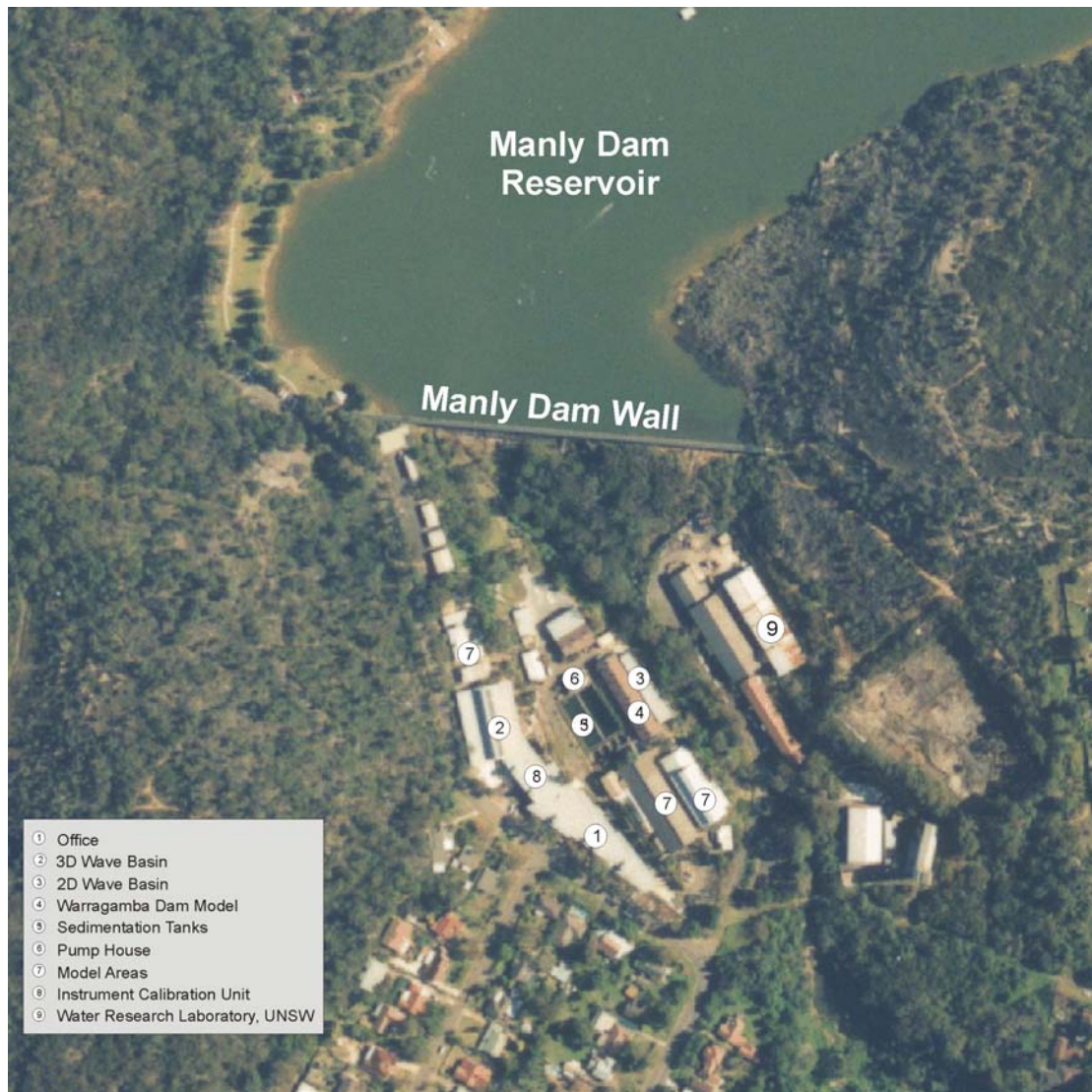
Today, two laboratories remain, with the incorporation of the Sydney Water Board Hydraulics Laboratory and the Water Conservation and Irrigation Commission Laboratory into MHL, in recent years.

With time, the work MHL carries out has changed as technology developments have lowered the need for physical modelling. However, physical modelling is still used today for complex flow investigations.

Built from small beginnings thirty years ago, MHL now operates the largest environmental data monitoring network in Australia with over 1000 field stations linked to computer databases at MHL, providing managers with timely information on a host of water parameters across NSW and beyond.



Location of Manly Hydraulics Laboratory



**View of Manly Hydraulics Laboratory
after completion of new office complex**

Plaque Nomination Form

Name of work: **Manly Hydraulics Laboratory**

The above-mentioned work is nominated to be awarded a

Historic Engineering Marker

Location: 110b King Street, Manly Vale NSW 2093

Map Ref: AMG Zone56 6260600N, 338500E

Owner: NSW Department of Commerce
 2-24 Rawson Place, Sydney NSW 2000

Access to site: Perimeter access is not restricted. Internally the access may be arranged with permission from the Principal Engineer/Manly Hydraulics Laboratory at the above address or by telephone; (02) 9949 0200

Nominating Body: NSW Department of Commerce (owner of the Laboratory).

Will Strachan
General Manager
Water Services
29 July 2004

Chair
Sydney Engineering Heritage Committee

Recommended for approval

Chair, Sydney Engineering
Heritage Committee

Date:

The Administrator
Engineering Heritage Australia
Engineers Australia
Engineering House
11 National Circuit
BARTON ACT 2600

Engineers Australia Historical Engineering Marker

Plaquing Nomination Assessment Form

It should be noted that while this application follows the template format set out by Engineers Australia, the emphasis for this submission for Manly Hydraulics Laboratory is focused upon its people, their intellectual output and the heritage importance of their contribution.

1. BASIC DATA

Item Name:	Manly Hydraulics Laboratory (MHL)
Other/Former Names:	NSW Department of Commerce Formerly a part of: Department of Public Works and Services (and previously) NSW Department of Public Works MHL incorporates (the former) Water Conservation and Irrigation Commission Laboratory (transferred to Public Works in 1986) and (the former) Sydney Water Laboratory (transferred to Public Works in 1994). MHL was also part of a joint business venture with the Water Research Laboratory (UNSW) trading as Australian Water and Coastal Studies Pty Ltd (AWACS) from 1987 to 1996.
Location:	AMG Zone 56 6260600N, 338500E
Address:	110b King Street, Manly Vale NSW 2093
Suburb/Nearest Town:	Manly Vale
State:	NSW
Local Govt. Area:	Warringah Shire
Owner:	NSW Department of Commerce (formerly Department of Public Works and Services)
Current Use:	Hydraulics Laboratory
Former Use (if any):	Water Supply
Designer:	Sydney Water Corporation and NSW Department of Commerce (their former incarnations)

Maker/Builder:	Sydney Water Corporation and NSW Department of Commerce (their former incarnations)	
Year Started:	1944	Year Completed: ongoing
Physical Description:	<p>Manly Dam was built in 1892 as a supply of potable water for Manly, and later for the Warringah area. Water treatment and pumping facilities were established immediately downstream of the dam on the site now occupied by Manly Hydraulics Laboratory (MHL).</p> <p>Manly Dam's storage capacity was increased 3 times by raising the dam wall but by 1929 it had reached its limit as a viable supply for the growing Manly-Warringah area and the western Sydney dams were adopted as the potable water sources for Manly and "the peninsular". The water in Manly Dam then became a resource available for hydraulic modelling purposes.</p> <p>MHL was established in 1944, taking advantage of the position of the site downstream of the Manly Dam wall where there was sufficient water supply and pressure head for hydraulic model testing. Initially the original water pumping station coal shed was used as a part time office. By 1949 MHL became a permanent facility. Two water treatment plant settling ponds and the pump house buildings and assemblies remain today from the early works that formed the potable water supply system.</p> <p>Buildings covering the hydraulic models and workshops were constructed as modelling work at MHL increased. A contemporary office building was designed and construction was completed in 1998.</p>	
Physical Condition:	<p>The laboratory facilities are well maintained and remain in satisfactory working order for model testing projects as they have done for the last 60 years. The facilities continue to be used for leading edge engineering studies. The office area was completely redesigned and newly constructed in 1998. The items from the water supply era are in fair to satisfactory condition. The settling ponds are still functional and are still used occasionally as measuring or storage tanks for hydraulic modeling purposes.</p> <p>MHL has the following facilities:</p> <ul style="list-style-type: none"> • A covered working experimental space of 2,230 sq m and an open-air experimental space of 3,530 sq m. • A 35m x 1m x 1.5m wave flume and a 30m x 30m x 1m wave basin both with random wave generation capability. • Several flumes of varying size some with glass viewing panels. Computer center with Internet 	

- site hosting and remote sensing GIS and database capabilities.
- Electronics workshop for construction and repair of instrumentation.
- Mechanical workshop for the construction of hydraulic models.
- Laboratory instrumentation for measuring most hydraulic parameters and a fully equipped instrument calibration unit. Field instrumentation to measure hydrodynamic and ocean processes.
- Pipelines from Manly Dam (a reservoir with 9 million cubic metre capacity) capable of delivering under gravity clean water flows of up to 1.13cumecs

Modifications and Dates: MHL was first established by the NSW Public Works Department in 1944 when the site downstream of the dam was used for testing a hydraulic model of the dam spillway for Oberon Dam. Access to the main road was via a bush track which has since become King St, Manly Vale. A complement of two staff made weekly visits from head office to MHL using the shed of the pumping station as an office.

By the early 1950s the number of staff increased and in 1951 a model of Port Kembla was constructed to design range and surge abatement measures in the harbour. In 1952 the first building foundations of MHL were laid, followed by construction of the main workshop building.

Three other Laboratories were also established downstream of Manly Dam - the Water Conservation and Irrigation Commission Laboratory (1942) and the Metropolitan Water Sewerage and Drainage Board (Sydney Water) Laboratory (1938), both of which were within the current MHL site, and also the UNSW Water Research Laboratory (1954) which is partly within and partly adjacent to the MHL site and is still in operation.

MHL was expanded in the 1970s to include a Soils Mechanics Laboratory which conducted soil and borrow pit investigations for dams and other structures. The Soils Laboratory was moved from the Manly Vale site to become a Geomechanical Laboratory in the Engineering Design Branch of the Public Works Department in the 1980's.

In 1986 (the former) Water Conservation and Irrigation Commission Laboratory was incorporated into MHL. In 1994 the former Metropolitan Water Sewerage and Drainage Board Laboratory was also incorporated into MHL.

The ad-hoc office buildings were demolished and a modern office complex was completed in 1998.

Since its establishment in 1944, MHL has expanded and many hydraulic models were built and tested. MHL now conducts physical, numerical, desktop and field studies primarily in NSW, but has also undertaken national and international projects.

Historical Notes:

It is the following “**people**” and their “**contribution**” criteria, which mark the true measure of MHL’s heritage value.

People: The people who now form MHL’s alumni and their intellectual output, past and present represent the important contributions made by MHL ... contributions to both the understanding of the hydraulic processes of our waterway environs and to the investigation and design of water infrastructure and environmental solutions throughout the State. Many young graduate engineers were trained at MHL in the science of hydraulic engineering. Many have continued their studies elsewhere and gone on to lead industry, government and academia as chief engineers, CEOs and Professors of Engineering.

Later in this submission a listing is provided of the individuals who make up MHL’s alumni, and those who have supported MHL in its endeavours. An oral history of MHL is also attached to this submission. In the time allowed it is only able to touch upon a sample of the memories of MHL’s personnel and their contribution over the past 60 years.

Contribution: Many significant water infrastructure projects for NSW were tested or optimised at the MHL facility over the last 60 years. The first model testing, carried out for the Oberon Dam spillway, was seen as strategically important for the war effort as Oberon Dam was to supply water to the shale oil production works at Glen Davis, west of the Blue Mountains. Given the State’s significant infrastructure investment on harbours, ports and breakwaters, MHL staff developed complex wave generation facilities (a first in NSW) to model, flume test and optimise wide range of structural designs. The MHL site still retains a 1:100 scale model of Warragamba Dam which is in excellent condition and was recently recommissioned and modified to test and optimise a design for the new side spillway to safely accommodate a significantly higher discharge arising from increased assessed maximum flood inflows. And today MHL leads in the collection, analysis and delivery of real-time water and environmental data to facilitate informed natural resource management decision making, risk reduction

and the saving of lives through a range of storm alert systems.

MHL is at the forefront of environmental and hydraulic engineering practice and has made a significant contribution to works of water engineering historic significance throughout NSW for the past 60 years. The significance of MHL and its amalgamated laboratories is in what it achieved in intellectual output, its development and adoption of leading edge technologies, and the solutions it has devised for complex hydraulic processes. MHL's pure and practical hydraulic research has had enormous benefits for the State ...in economic, social and environmental terms.

Site: The site has its roots in the late 19th century as a water supply source for the local area. Some relic items remain today from these early works within the precincts of MHL. When the water supply facility ceased operation the downstream area provided a unique opportunity to provide a source of water under pressure from the dam supply for hydraulic investigation and modelling purposes.

Heritage Listings (information for all listings)

The Heritage listings deal mainly with the Manly Dam structure itself, however there are listings for the sedimentation tanks and pump station as well. Manly Dam and its upstream environs are not owned by, nor are part of MHL. MHL occupies the site on which the water treatment plant was built in 1920. The pump building and sedimentation tanks still exist on the MHL site.

Name:	State Heritage Register
Title:	Manly Dam
Number:	01327
Date:	18 November 1999
Assessment Criteria:	Manly Dam is assessed as historically rare regionally, and socially representative locally
Name:	Sydney Water s170 Register (Local Government and state Agency Register)
Title:	Manly Dam, Manly Dam Wall
Number:	2610067 and 4573702
Date:	5 December 2000 and 1 January 2000
Significance:	"The former treatment plant and pumping station are also significant but are not owned by the Sydney Water Company" (ownership resides with NSW Department of Commerce)
Name:	Register of the National Estate
Title:	Manly Dam and Surrounds
Number:	1994

Date:	27 March 2001
Significance:	Comprises Manly Dam, the Manly Warringah War Memorial Park and adjoining bushland to the north. Includes "the old Water Treatment Works, sedimentation tanks and the filter beds located below the dam wall."
Name:	National Trust of Australia (NSW)
Title:	Manly Dam and Old Water Treatment Works
Number:	NTN.05
Date:	20 July 1987
Significance:	"As regards the extremely well presented sedimentation tanks and the filter beds of the old water treatment works, the fact that, as far as is known, there is no other similar ones extant in the Sydney Water Board's area of operations"
Name:	Warringah Council LEP 2000
Title:	Manly Dam
Number:	N/A
Date:	LEP 2000
Significance:	Local heritage significant Conservation Area

2. ASSESSMENT OF SIGNIFICANCE

Historic Phase: MHL is the only facility of its type owned by the State today and is unique in Australia for its type.

Water infrastructure projects in NSW are mostly developed by the state government or its agencies. NSW Department of Commerce (formerly Department of Public Works and Services) has been the primary investigating/constructing agency for this work since the 1850s. Hydraulic testing of scale models of dams, flood mitigation schemes and coastal structures can refine designs and test options to realise major projects cost savings, reduce risk and optimise the lives of structures.

Hydraulic modelling and other investigative activities have been provided at MHL since its beginnings in 1944. Over the past 60 years MHL has responded to the water engineering needs of NSW. The site, staff and the facilities have all played a continual and ongoing role during this time in the investigation, design, building, maintenance and risk management of water infrastructure projects.

Historic Individuals or Association:

Many young graduates were trained at MHL in hydraulic engineering with many continuing their studies elsewhere and going on to lead industry, local government and academia as chief engineers, CEOs and Professors of Engineering. MHL has been a centre of excellence through which many water engineers have developed

their knowledge, skills and expertise. Many have sought out such experience at MHL before progressing to other areas of the water industry. A list of such people shows the significance of MHL staff on the water engineering capabilities in Australia and especially in NSW:

- Bruce Sinclair AO, ex Officer in Charge MHL, now retired, was a partner in the formation of Sinclair Knight consulting engineers.
- Professor Michael Gourlay, Professor, University of QLD
- Professor John Hindwood, Professor, Monash University
- Doug Foster, first director Water Research Laboratory
- Peter Stone, ex Officer in Charge MHL, now senior consulting engineer UNSW.
- Angus Gordon, ex Manager MHL, now General Manager Pittwater Council
- Will Strachan, ex Principal Engineer MHL, now General Manager Sustainable Water Solutions (Department of Commerce)
- Dr Bruce Cathers, senior lecturer UNSW
- Dr Tony Webb, senior lecturer Aust Defence Force Academy
- Dr Bruce Harper, James Cook University
- Doug Lord, Coastline Manager, DIPNR
- Doug Foster, first director Water Research Laboratory
- Dr Bill Peirson, senior Lecturer UNSW
- Mr Neil Sena, NRMA
- Mr Jeff Wilson, General Manager, Australian Water Technologies
- Mr Peter Spurway, senior engineer, Eurobodalla Shire Council
- Geoff Ridd, Arthur Lucas, Emmett O'Loughlin, P J Moore, all retired.

Together with these leading engineers, MHL was a home to highly inventive, qualified, dedicated and creative people whose work in the pursuit of water engineering excellence contributed to the Laboratory's national and international influence in the development of physical and numerical modeling capability and instrumentation.

The accuracy required for construction and measurement of small scale of physical models necessitated staff with unparalleled levels of skill and an attitude of always searching for perfection. Whilst these people may not have been leaders in the water engineering professions the quality of work produced at MHL would not have been possible without them; they include:

- Bill Linay, Ron Smith, Richard Clark, Errol Perry, Jack Cobb, Stan Robertson, Col Moore, Brian Cardwell (workshop foremen and craftsmen)

- Mike Todd, Andrew Allan, Col Nalty, Clive Swatton, Norm Becker, George Marshall, Bruce Schotel, Dan Susko (instrumentation)

MHL has also enjoyed the patronage of key clients and executive personnel in various corporate Public Works Levels:

- Cyril Floyd, Inspecting Engineer, Harbours & Rivers
- Wal Pilz, Director of Public Works
- Glan Evans, Principal Engineer, Coastal
- John Malone, Principal Engineer, Coastal
- Michael Clarke, Chief Engineer
- Mike Geary, Manager, Coastal Branch, Public Works
- Ron Eagle, Deputy Director General, Public Works
- Mark Porter, Director, Coastal Manager, Department of Infrastructure, Planning and Natural Resources

The continuation of this expertise under the present Principal Engineer, Dr David van Senden, shows the significance of the contribution of the personnel at MHL. The following key personnel continue the tradition of previous staff and are leaders in their respective fields:

- Peter Davidson (data collection & environmental flows)
- Mark Kulmar (NSW wave climate),
- Phil Anderson (water cycle and effluent disposal)
- Bronson McPherson (floodplain management)
- Jim Lawler (diving and instrumentation)
- Tony Bolton (electronics, IT and instrumentation)
- John Sayce (hydraulic model construction and materials specialist).

The oral history CD of MHL attempts to capture some of the memories and thoughts of MHL's alumni.

Creative or Technical Achievement:

MHL has devised many clever solutions for complex problems and designed water engineering infrastructure projects in the fields of coastal management, breakwater and harbour designs and dam and spillway design and testing.

MHL has been at the forefront of technology over the past 60 years and has played a role in most of the significant water engineering works undertaken in NSW over this time. MHL has also led the industry and greatly assisted its clients with the development and early adoption of advances in technology. An example of this is the change that took place during the 1970s when physical modelling alone was sometimes replaced by hybrid physical/numerical modelling techniques. Later pure numerical models were used to determine outcomes on projects under investigation. MHL was also an early adaptor of computer use in laboratory techniques and

has led the way in WEB based delivery of environmental water data.

Many of engineering projects undertaken by MHL are considered works of engineering heritage significance in their own right. The following lists show MHL's long term involvement in many of the studies leading to these works of water engineering heritage significance in NSW. This brief summary shows the range of studies and localities that MHL has been involved with:

Hydraulic Model Testing and Design of Dams, Weirs

Floodways – Oberon, Burrinjuck, Warragamba, Burrendong, Pindari, Copeton, Glenbawn, Keepit, Hume Reservoir, Wyangala, Lake Ballyrogan, Glenbawn, Pine Creek, Brogo, Wyong Freeway, Liverpool Weir, Morpeth Floodgate, Chaffey, Pejar, Mangrove Creek, South Creek Floodway, Chipping Norton Floodway, C.H. Hall, Glenlyon, Yanco Weir, Erina Creek, Mulwala Canal, Bray Park Weir, Toongabbie Creek, Split Rock, Windamere, Dungowan, Maitland overbank Spillway.

Floodplain Management Studies – Hunter River, Narrabeen Lagoon, Manning River, Lake Conjola, Lake Illawarra, Lake Cathie, Manly Lagoon, Wooli, Hawkesbury, Macleay, Belmore, Clarence, Richmond, Shoalhaven, Brisbane Waters, South Creek, Tweed, Chipping Norton, Georges River, East Hills, Port Stephens, Lake Macquarie, Camden Haven.

Harbour and Breakwater Models and Studies – Port Kembla, Coffs Harbour, Eden Fishing Port, Wooli, Narooma, Hay Point (QLD), Jerudong Park (Brunei), Kuwait Pearls Harbour (Kuwait), Nelson Bay, Sydney Airport Parallel Runway, Tweed Heads Entrance, survey of all breakwaters on the NSW coast, model studies of Ballina, Eden, Coffs Harbour, Crowdy Head, Clarence, Bermagui, Swansea, Forster and Port Kembla breakwaters.

Coastal Processes Hazards and Management Studies and Models

– Newcastle Harbour, Port Kembla, Botany Bay Beaches, Broken Bay, Central Coast Beaches, Coffs Harbour Beaches, Pottsville/Kingscliff, Coogee Beach, Judong Beach (Brunei), Jumeirah (Dubai), Letitia Spit Tweed Heads, Newcastle Bight/Stockton Beach, Byron Bay/Brunswick Heads/New Brighton, Pittwater Beaches, Port Stephens Beaches, Shoalhaven Entrance, Sussex Inlet, Sydney Beaches, Sydney Shelf, Tathra, Warilla.

Ocean Outfall and Environmental Studies – Byron Bay, Coffs Harbour, Norah Head, Brisbane Waters, Wonga Point, Forster, Culburra, Wybung, St Georges Basin, Toukley, Moonee, Wollongong, Urunga, Coffs Northern areas, Port Macquarie, Brunswick Heads, Eden, Boulder Bay, Lake Macquarie/Belmont, Central Coast,

First Point, Milson Island, Curl Curl Lagoon, Botany Bay, Bate Bay, Sydney Deepwater Outfalls, Illawarra, Gerringong, Jervis Bay, Sussex Inlet, Tomakin, North Batemans Bay.

Data Collection Network - With improvements in technology and computer techniques, MHL saw opportunities to improve the way environmental hydrometric data was captured and stored. Today MHL manages and operates a data capture and delivery network system that is state-of-the-art with the capacity to provide clients with near real-time data from over 1,000 field stations recording wave, tides, estuarine, river, rainfall, and other data. Monitoring of water quality parameters at scores of NSW estuary sites and implementation of flood warning systems is a more recent expansion of this work. Clients and the public now have quick access to many of the data listed above via the Internet.

Other Studies and Facilities – MHL also has a specialist underwater diving capability. The diving team has recently been involved in locating and position fixing many shipwrecks as part of an atlas published by the NSW Heritage Office.

MHL has also taken lead roles in new technology and developing areas of work such as GIS, wetlands and environmental studies (such as early warning systems for algal blooms) and sewer flow monitoring.

MHL has been associated with most engineering works of significance in the water related field in NSW. MHL has been shown to be creative, technically innovative and accredited nationally and internationally, particularly in the field of hydraulic physical modeling and field data collection.

Research Potential:

MHL has provided, and will continue to deliver, substantial scientific information in regard to water engineering projects. MHL has pioneered design development of structures and is constantly undertaking leading edge work in water and environmental fields. MHL is a benchmark reference site for water engineering in NSW. It also provides a historical perspective of the development of water engineering designs and practices in NSW over the period of its history.

Social:

MHL is identifiable in the community. Through the many projects throughout its history, MHL is well-known by both the water industry and the general public.

MHL's Internet based delivery of data allows both clients and the public to access data and forms an important social link to the Laboratory. In particular MHL data is

provided to the Bureau of Meteorology, Department of Environment and Conservation (Environment Protection Authority), media ocean temperature and tidal details, surfing, fishing and community websites. MHL is acknowledged as the only provider of such data in NSW. MHL also conducts laboratory visits and open days for the public, schools and organisations. MHL has an important role in the NSW community particularly amongst recreational water enthusiasts.

MHL's projects have enhanced the social, environmental and economic infrastructure of NSW, which have in turn improved the lifestyle of the communities within NSW.

Rarity:

Many laboratories similar in type to MHL have closed (nationally and internationally) or amalgamated in recent times. The incorporation of the former Water Conservation & Irrigation Commission and Sydney Water Corporation laboratories into MHL is an example of this trend. MHL is one laboratory that remains open, active and of demonstrable value to the development of water infrastructure and natural resource management. MHL continues a tradition of hydraulic modeling, investigation and data collection (including work from the amalgamated laboratories) which is not carried out anywhere else in NSW within a government framework. The work undertaken maintains previous traditions and is in line with other world leading overseas laboratories such as Delft Hydraulics (The Netherlands), The Danish Hydraulic Institute, Wallingford Hydraulic Laboratory (UK) and The US Army Engineers Waterway Experiment Station.

Representativeness:

MHL is a traditional hydraulics laboratory covering the full range of activities from physical modelling to data collection, investigation and design. It is representative of hydraulic laboratories in other parts of the world but which no longer exist elsewhere in NSW within a government owned entity.

Integrity/Intactness:

MHL is a single physical entity that continues to occupy the original site, which it owns, below the Manly Dam wall. MHL is an ongoing leading edge laboratory continuing a 60 year history within the water engineering field. The integrity is being added to daily as MHL strives to provide leading edge solutions to water engineering issues and problems.

References:

Aird W. V., 1961, *The Water Supply, Sewerage and Drainage of Sydney*, Halstead Press

Beasley M., 1988, *The Sweat of their Brows - 100 Years of the Sydney Water Board 1888 - 1988*

Clark S. & Collocott J. M, 1987, *Manly Dam and Old Water Treatment Works*, National Trust Register Classification card.

Coltheart, L (1997). *Between Wind & Water – A History of the Ports and Coastal Waterways of New South Wales*. Hale & Iremonger, Sydney, 208p.

Coltheart L and James C, 1987, Dates of Construction of Breakwaters and Training Walls by Public Works Department of New South Wales 1856 – 1986, reference report for PWD.

Gourlay, M.R., 1996, *History of Coastal Engineering in Australia*. In Kraus, N.C. (Ed), *History and Heritage of Coastal Engineering*. American Society of Civil Engineers, New York, pp 1-88

Gourlay, M.R., 2000, *History of coastal engineering in Australia. Keynote Address in Cox, R.J. (Ed). Abstracts: 27th International Conference on Coastal Engineering*, 16-21 July 2000, Sydney, Australia. The Institution of Engineers, Australia, Barton, ACT, Vol. 1, pp 1-6.

Heritage Office, 1996, *Shipwreck Atlas of New South Wales*. NSW Heritage Office, Sydney.

MHL internet site - www.mhl.nsw.gov.au

Many other references are available for work carried out by MHL which includes but is not limited to:

Over 1200 MHL reports have been produced in the 60 years of operation, together with many Australian and international scientific papers

MHL is referred to in many PWD, DPWS and Department of Commerce publications and Annual Reports.

Statement of Significance:

The heritage significance of Manly Hydraulics Laboratory (MHL) derives primarily from the contributions MHL personnel have made to the design and facilitation of important water engineering works, many of which are now heritage items in their own right. MHL has been a centre of excellence through which many staff have developed and contributed to the expertise, understanding and knowledge of the hydraulic processes of our waterway environs, and to the investigation and design and development of water infrastructure and environmental solutions throughout the State. Many of MHL's alumni have gone on to leadership roles in the water industry, local government and academia.

Many significant water infrastructure projects for NSW have been tested or optimised at this facility over the last 60 years. The first model testing, carried out for the Oberon Dam spillway, was seen as strategically important for the war effort as Oberon Dam was to supply water to the shale oil production works at Glen Davis, west of the Blue Mountains. Given the State's significant

infrastructure investment on harbours, ports and breakwaters, MHL staff developed complex wave generation facilities (a first in NSW) to model, flume test and optimise structural designs. The MHL site still retains a 1:100 scale model of Warragamba Dam which is in excellent condition and was recently recommissioned and modified to test and optimise a design for the new side spillway to safely accommodate a significantly higher discharge arising from increased assessed maximum flood inflows. And today MHL leads in the collection, analysis and delivery of real-time water and environmental data to facilitate informed natural resource management decision making, risk reduction and the saving of lives through a range of storm alert systems.

MHL is at the forefront of environmental and hydraulic engineering practice and has made a significant contribution to works of water engineering historic significance throughout NSW for the past 60 years. The significance of MHL and its amalgamated laboratories is in what it achieved in intellectual output, its development and adoption of leading edge technology and the solutions it devised for complex hydraulic processes. MHL's pure and practical hydraulic research has had enormous benefits for the State ...in economic, social and environmental terms.

MHL is built upon the 19th century water supply facility established for the Manly area. Some parts of the original water treatment plant (National Estate and National Trust registered) still exist in good condition on the MHL site.

Assessed Significance State and local.

Proposed Citation

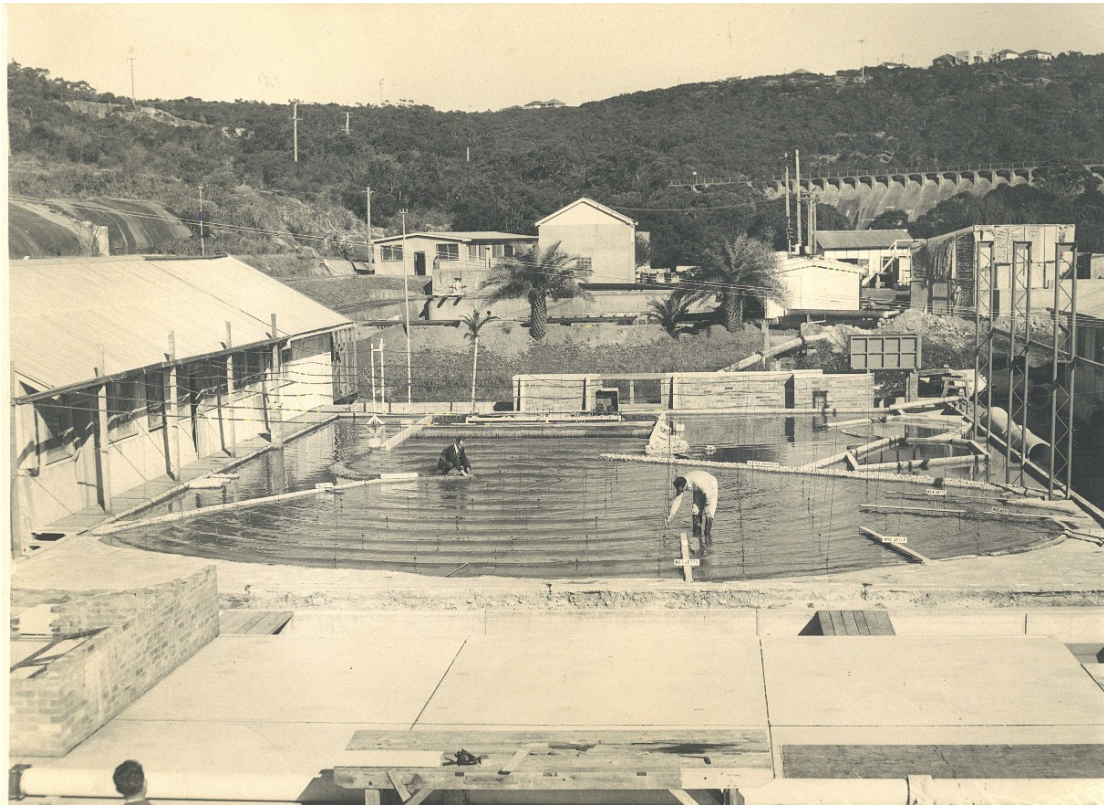
HISTORIC ENGINEERING MARKER

Manly Hydraulics Laboratory

This research facility was established by the Department of Public Works in 1944 to solve hydraulic and coastal engineering problems using physical models and water from the abandoned Manly water supply dam. It became a centre of excellence developing expertise in hydraulic problem-solving, training hydraulic engineers and making major advances in investigative techniques and instrumentation. The laboratory has contributed significantly to the economical design of hydraulic structures within Australia and abroad, and its data collection program is of considerable social and engineering benefit.

The Institution of Engineers Australia
Department of Commerce, NSW 2004

Images:



Hydraulic model of Port Kembla c. 1953 prior to most building construction, with dam wall & water supply structures in the background



Aerial view of the MHL site including Manly Dam



**Foreman Bill Linay measuring surge at proposed No. 6 jetty, Port
Kembla Harbour model, C. 1953**